PEGASUS ENERGY PROJECT, Inc.

A Non-Profit Research and Development Corporation *"Working for a better Planet Earth"*

P.O. Box 932
White River Junction, Vermont 05001
USA

(603) 298-9095
info@pegergy.org

July 17, 2006

Mr. Robert Sydney, Esq.
General Counsel
Massachusetts Division of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

re: **Proposed Revision of the RPS Regulations - June 2, 2006 / Final Comments**

Dear Mr. Sydney,

We welcome this opportunity to submit our final comments to the proposed revision of reference. Contrary to what we had originally planned, we will restrict our comments to 225 CMR issues as they relate to the specific technology we sponsor and to the plant owners and operators who will be applying it.

Introduction

First we would like to outline our position in this matter which, perhaps, is a little different to that of other stakeholders. We are not power project developers nor do we own any generating plants, but we do have an interest in assisting wood chip biomass plants operating in the region, particularly those coming to an end of very favorable power purchase agreements granted under PURPA.

We also recognize the need for Massachusetts Division of Energy Resources (DOER) to regulate the Renewable Energy Portfolio Standard program to ensure its economic stability during its nascent stages, hence the narrow definition of waste heat suggested in our initial comment.

The Massachusetts General Laws, Chapter 25A: Section 11F, refers to two distinctive objectives. In this respect we interpret the word "new" to mean increased generating capacity from renewable energy resources and we also see this term as referring to the support of emerging technologies, such as those covered in 225 CMR 14.05 (solar energy, wind energy, ocean thermal, wave or tidal energy).

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In our initial comments we petitioned DOER to include two new categories of eligible Fuels, Energy Resources and Technologies, namely 'geothermal' and 'waste heat'. The technology we are sponsoring can be applied advantageously in both these fields. However, given the urgency of the situation confronting some wood chip facilities, we will obviously concentrate our efforts in the area of waste heat.

Supporting Facts

Here we seek to give a brief but clear picture of how our technology fits into the power generation scenario, and we start with a few simple comparisons to some well-known power generation systems.

A combined heat-and-power (CHP) facility converts fuel to energy for two different uses, namely one for heating and one for producing electric power. This arrangement achieves high efficiency but, if only the electric power generation were considered, then the facility would operate at a lower efficiency since the fuel consumption would remain the same for less output.

Another example is that of a combined cycle (CC) plant. Here we have a combustion turbine burning a liquid or gaseous fuel to drive an electric generator. The hot exhaust from the combustion turbine is used to produce high pressure steam in a special type of boiler (HRSG). This powers a steam turbine which, in turn, drives a second electric generator. The combined electric output for the plant is obviously greater than the output from either of the generators on their own.

The manometric technology we propose is very similar to the preceding combined cycle example. The first electric generator is part of a conventional steam-driven electric plant. This would be followed by a manometric engine, which is capable of operating cost-effectively from the temperature of the cooling water leaving the steam plant's condenser. The manometric engine produces a high pressure stream of water to drive a conventional hydropower turbine coupled to an electric generator. Once again, we have the two generators.

The common factor in each of the above examples is the presence of a second electric generator in the path of the overall thermodynamic process. The three examples would all be capable of achieving high efficiencies.

The speed of rotation of the manometric engine is too low to enable mechanical power to be extracted directly. The most practical and cost-effective solution is the provision of a hydro turbine to drive the second generator at the required speed. It is also worth noting that innovation applies to the manometric engine only. The hydroturbine and associated generator are machines which have been proven over many years.

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Recovered Energy Generation

In a conventional steam-powered generating plant, it is generally accepted that a major portion of the total heat released by the combustion process – about 40% of its total heat value – is exhausted to the atmosphere via cooling towers or some other means of removing heat from the steam condenser. The energy content of this waste stream is quite substantial and could, if translated into electrical units, exceed the output of the steam plant itself. However, due to its relatively low temperature, this potential energy source remains untapped except by special waste heat recovery technologies. The manometric engine falls into this category.

The amount of energy that can be converted into electric power will depend on several factors, but capital investment must rank among the foremost. Limiting capital investment would introduce some flexibility and, particularly when initially adopting such technologies, pioneering plant owners and their investors could reduce their risk by exploiting only part of the total energy potential available. Once again, RECs would play an important role in offsetting the negative effects of such precautionary strategies and the reduced output potential that would result.

Some Considerations Affecting Qualification

There are important considerations that must be taken into account when assessing the manometric engine and its application as described.

a) Although the manometric engine relies on the host facility for its heat, it is not closely integrated into the plant, as would be the case in a conventional combined cycle plant. It can therefore be looked upon, together with its associated hydroturbine, as a separate generation unit in its own right and, more especially, a zero-emissions New Renewable Generation Unit.

b) Practically all forms of renewable energy face difficult challenges in securing development and project funding, but for emerging technologies, such as those listed in 14.05 (1); (a) 1 through 5, the challenges can be magnified by the inherent uncertainties present in renewable energy markets. The underlying purpose of Renewable Energy Credits (RECs) is to promote investment in renewable energy by reducing the higher risks associated with this sector of the power generation industry.

c) With few exceptions, innovation in the power generation field stems from time-proven basic fundamentals. In order to attract funding on favorable terms the fledgling technologies that emerge must have, if they are to survive, the support of tax breaks, the promise of earned RECs, and other such financial incentives.

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d) Manometric technology, on the other hand, is based on fundamentally new concepts and thus cannot count on this established background of history and experience. In the eyes of potential investors the associated risk factors would be multiplied tenfold. Therefore, even though we believe that manometric technology is much closer to commercialization than others in its class, the challenges facing investors and plant owners alike are that much greater.

e) Re-powering, re-tooling, and emissions control efforts, as described by those stakeholders having an interest in developing or operating thermoelectric biomass plants, might result in modest improvements in performance, but at the expense of increased internal power consumption or overhead. This leads to a corresponding reduction in the plant's dispatchable power. Waste heat recovery technologies, on the other hand, would actually increase plant output and, in many instances, by a substantial amount.

Conclusions

- We believe that the emerging technologies relating to waste heat recovery, as referred to in the foregoing, are in absolute compliance with the spirit and the tenets of 'Massachusetts General Laws, Chapter 25A: Section 11F. Renewable energy portfolio standard for retail electricity suppliers', both by increasing electric power supply from renewable resources, and by fostering new renewable power generation technologies.

- We must reiterate the fact that waste heat recovery systems placed beyond the final thermodynamic process of a conventional steam generating plant, do constitute virtually separate and independent generation units in their own right, rather than modifications or upgrades to existing plant. We therefore believe that this notion, together with the fact that the "fuel" utilized is existing heat which otherwise would go to waste, unequivocally reinforces the view that waste heat should be accepted as an energy source which automatically qualifies as a valid criterion for determining the eligibility of New Renewable Generation Units.

- In view of the situation currently facing some wood chip facilities we respectfully request that our petition be given serious consideration with utmost urgency. Such facilities, adopting any RPS Qualified waste heat recovery systems, would be assured from the outset of receiving RECs for at least a portion of their project. The prospect of earning RECs would surely go a long way towards gaining the confidence of investors and plant owners alike. Even the most modest monetary gain per MW dispatched could spell the difference between their survival and their permanent closure.

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And so we conclude our final comments in the hope that our efforts, together with those of the other stakeholders who have submitted comments, will lead to the passing of fair and equitable legislation in support of the Massachusetts Renewable Energy Portfolio Standard.

Sincerely,

Alan E. Belcher
President
Pegasus Energy Project, Inc.

belchera@ASME.org

This hardcopy has also been transmitted via e-mail as file "FinalComments.pdf" to 'doer.rps@state.ma.us' and to 'robert.sydney@state.ma.us'.